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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/754,572	01/12/2004	Mun-Pyo Hong	8071-121T (OPP031985US)	8242
7590 F. Chau & Associates, LLC 130 Woodbury Road Woodbury, NY 11797			EXAMINER CHU, CHRIS C	
			ART UNIT 2815	PAPER NUMBER
			MAIL DATE 01/02/2008	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/754,572	Applicant(s) HONG ET AL.	
	Examiner Chris C. Chu	Art Unit 2815	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 October 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 10, 14, 15, 45 - 51 and 54 - 58 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 10, 14, 15, 45 - 48, 50, 51 and 54 - 58 is/are rejected.
- 7) ☒ Claim(s) 49 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☒ Certified copies of the priority documents have been received in Application No. 09/751,840.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Response to Amendment*

1. Applicant's amendment filed on October 2, 2007 has been received and entered in the case.

### *Claim Objections*

2. Claims 47 and 49 are objected to because of the following informalities:
  - (A) In claim 47, line 1 and 2, "the insulating layer" should be -- the gate insulating layer --, because the limitation should be consist with other claims.
  - (B) In claim 49, line 7, "a external" should be --an external--.Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 10, 15, 45 – 47, 50, 51 and 54 – 58 are rejected under 35 U.S.C. 102(e) as being anticipated by Sakata et al. (U. S. Pat. No. 6,252,247).

Regarding claim 10, Sakata et al. discloses in e.g., Fig. 3 a contact structure of a wire (see the structure in e.g., Fig. 3), comprising:

- a wire (2; column 5, lines 63 – 67) of a conductive material on a substrate (1; column 4, lines 61 and 62), wherein the wire (2) is made of a conductive material including aluminum-based material (column 5, lines 63 – 67);
- an inter-layer reaction layer (3) formed on the wire (2) and including inter-metallic compound comprising Al (column 6, lines 1 – 5), wherein the inter-metallic compound (3) is formed by depositing a metal layer (Al) on the wire (2) and annealing the metal layer (column 8, lines 15 – 19 and see e.g., Fig. 3); and
- a conductive layer (11; column 5, lines 51 – 55; since ITO is one of well known conductive material and the layer 11 is formed by the ITO, the layer 11 of Sakata et al. is a conductive layer) directly connected to the wire (2) via the inter-layer reaction layer (3; see e.g., Fig. 3, at the right-side).

Regarding claim 15, Sakata et al. discloses in e.g., Fig. 3 an insulating layer (9; column 5, line 43) having a contact hole (the opening for the layer 11) exposing the inter-layer reaction layer (3) between the wire (2) and the conductive layer (11; see e.g., Fig. 3, at the right-side).

Regarding claim 45, Sakata et al. discloses in e.g., Fig. 3 a thin film transistor array panel (column 1, line 9), comprising:

- a gate wire (2; column 4, line 62) made of a first conductive material (column 5, lines 63 – 67) on an insulating substrate (1; column 4, lines 61 and 62);
- a gate insulating layer (4; column 4, lines 64 – 65) covering the gate wire (2; see e.g., Fig. 3, at the left-side);

- a semiconductor layer (5; column 4, line 65) formed on the gate insulating layer (4; see e.g., Fig. 3, at the left-side);
- a data wire (7; column 4, line 67) made of a second conductive material (column 6, lines 6 – 8) on the gate insulating layer (4) and the semiconductor layer (5; see e.g., Fig. 3, at the left-side);
- a passivation layer (9; column 5, line 43) covering the data wire (7; see e.g., Fig. 3, at the left-side);
- an inter-layer reaction layer (8) formed on the gate wire (2) and the data wire (7; see e.g., Fig. 3, at the left-side), wherein the inter-layer reaction layer (8) includes inter-metallic compound comprising Al (column 7, lines 18 – 21) and the inter-metallic compound (8) is formed by depositing a metal layer (Al) on the gate wire (2) and the data wire (7) and annealing the metal layer (Al; column 8, lines 15 – 19); and
- a transparent conductive layer pattern (11; column 5, lines 51 – 55 and column 11, lines 26 – 31; since ITO is one of well known transparent conductive material and the layer 11 is formed by the ITO, the layer 11 of Sakata et al. is a transparent conductive layer) electrically connected to the gate wire (2) or the data wire (7) through a contact hole (the opening in the layer 9) of the gate insulating layer or the passivation layer (9; see e.g., Fig. 3, at the left-side),
- wherein the transparent conductive layer pattern (11) is electrically connected to the gate wire (2) or the data wire (7) via the inter-layer reaction layer (8; see e.g., Fig. 3, at the left-side).

Regarding claim 46, Sakata et al. discloses in e.g., Fig. 3 the first (2) and second (7) conductive material including a metal of aluminum-based material (column 5, lines 63 – 67 and column 6, lines 6 – 8).

Regarding claim 47, Sakata et al. discloses in e.g., Fig. 3 the [gate] insulating layer (4) and the passivation layer (9) being made of silicon-nitride (column 5, line 24 and column 5, line 47).

Regarding claim 50, Sakata et al. discloses in e.g., Fig. 3 the inter-layer reaction layer (8) including silicon or transition metal (column 7, lines 18 – 21).

Regarding claim 51, Sakata et al. discloses in e.g., Fig. 3 a wiring contact structure (the wiring structure in e.g., Fig. 3), comprising:

- a first wire (2) formed of a conductive material, wherein the first wire contains aluminum (column 5, lines 63 – 67); and
- a second wire (3 and 11) formed on and in contact with the first wire (2; see e.g., Fig. 3), the second wire (3 and 11) comprising:
  - \* a first conductive layer (11) formed of a conductive material (column 5, lines 51 – 55 and column 11, lines 26 – 31); and
  - \* a second conductive layer (3) sandwiched between the first wire (2) and the first conductive layer (11) and containing inter-metallic compound (the Al compound within the layer 3) comprising Al (column 6, lines 1 – 5), wherein the inter-metallic compound (the Al compound within the layer 3) is formed by depositing a metal layer (Al) on the first wire (2) and annealing the metal layer (Al; column 8, lines 15 – 19), and

- wherein the first conductive layer (11) is directly connected to the first wire (2) via the second conductive layer (3; see e.g., Fig. 3).

Regarding claim 54, Sakata et al. discloses in e.g., Fig. 3 the first conductive layer (11) being formed of a transparent conductive material (column 5, lines 51 – 55 and column 11, lines 26 – 31; since ITO is one of well known transparent conductive material and the layer 11 is formed by the ITO, the layer 11 of Sakata et al. is a transparent conductive layer).

Regarding claim 55, Sakata et al. discloses in e.g., Fig. 3 the inter-layer reaction layer (3) directly contacting the conductive layer (11; see e.g., Fig. 3, at the right-side).

Regarding claim 56, Sakata et al. discloses in e.g., Fig. 4 the inter-layer reaction layer (12; column 7, lines 59 and 60) being formed only on a portion of the wire (42; column 7, lines 62 and 63) exposed through a contact hole (the opening; see e.g., Fig. 4).

Regarding claim 57, Sakata et al. discloses in e.g., Fig. 3 the second conductive layer (3) directly contacting the first conductive layer (11; see e.g., Fig. 3).

Regarding claim 58, Sakata et al. discloses in e.g., Fig. 4 the second conductive layer (3) being formed only on a portion of the first wire (2) exposed through a contact hole (see e.g., Fig. 4).

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 14 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakata et al. in view of Sasaki et al. (U. S. Pat. No. 6,444,296).

Regarding claims 14 and 48, while Sakata et al. discloses the use of the conductive layer (claim 14) and the transparent conductive layer pattern (claim 48), Sakata et al. does not disclose the specific material of the conductive layer and the transparent conductive layer pattern. Sasaki et al. teaches in e.g., column 2, lines 41 – 42 a transparent conductive layer pattern being made of indium zinc oxide. It would have been obvious to one of ordinary skill in the art at the time when the invention was made to apply the indium zinc oxide of Sasaki et al. as the specific material to form the conductive layer and the transparent conductive layer pattern of Sakata et al. as taught by Sasaki et al. to decrease the electrical resistance value of the contact portion (column 2, lines 36 – 37).

*Allowable Subject Matter*

7. Claim 49 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

(A) Claim 49 contains allowable subject matter because none of references of record teach or suggest, either singularly or in combination, at least the limitation of a gate wire including a gate line, a gate electrode connected to the gate line, and a gate pad which is connected to the gate line and receives a signal from an external circuit, and the data wire includes a data line, a source electrode connected to the data line, a drain electrode which is



separated from the source electrode and opposite to the source electrode with respect to the gate electrode, and a data pad which is connected to the data line and receives a signal from an [a] external circuit.

### *Response to Arguments*

8. Applicant's arguments with respect to claims 10, 45 and 51 have been considered but are moot in view of the new ground(s) of rejection.

### *Conclusion*

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chris C. Chu whose telephone number is 571-272-1724. The examiner can normally be reached on 11:30 - 8:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Parker can be reached on 571-272-2298. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Chris C. Chu  
Examiner  
Art Unit 2815

c.c.  
Tuesday, December 25, 2007



KENNETH PARKER  
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